Live cattle can be scanned with ultrasound to evaluate meat marbling quality and fat content. This noninvasive technique could be used by breeders in the future to select superior breeding stock.

JACK DYKINGA (K3908-15)

Ultrasound Helps Producers Find Ideal Cattle

Ultrasound is commonly used by doctors to check on the health of a human fetus or to scan a patient's organs. Ultrasound has also been used to study fetuses in livestock. But now, Agricultural Research Service and Iowa State University scientists have found that scanning a live cow with ultrasound can determine its fat and marbling qualities just as well as measurements taken on the carcass can.

Ultrasound is delivered via a small, noninvasive, hand-held probe that emits sound waves. These sound waves are turned into images that are displayed on a monitor so researchers can see inside the body. Trained technicians use the same machine as obstetricians do, but it has been modified for livestock use. The probe is placed on the animal's back (the part used in rib-eye steak) to see how lean and muscular the animal is as well as how much marbling it has. Marbling—the little pieces of fat in the middle of steaks—adds flavor.

The research on using ultrasound to determine carcass quality was conducted cooperatively by Iowa State University and ARS scientists using steers produced and evaluated at ARS' Roman L. Hruska U.S. Meat Animal Research Center (MARC) in Clay Center, Nebraska. Ultrasound evaluations and data analyses were conducted by Scott Greiner, now an extension agent at Virginia Tech University, at Iowa State University in the early 1990s. But researchers have been using ultrasound on livestock since the 1950s. Producers want ways to know whether the cattle they breed will produce quality beef, but they usually know this only when the animal has been processed.

While scanning each animal may take only a few minutes, research leader Larry V. Cundiff says this technology will be used mainly by producers of breeding stock. "It can be used to identify and select superior breeding stock for production of progeny with high levels of marbling and relatively low levels of fat trim," Cundiff says.

The researchers at MARC and Iowa State developed equations to see how accurate ultrasound is in determining quality beef. Greiner states, "With ultrasound, the predicted composition of the live animal closely matches the composition seen in the carcass."

The Angus breed of cattle is the most popular one on which to use the technology, but ultrasound can be used on all breeds. "The industry has widely and rapidly adopted ultrasound use," Greiner says. Each ultrasound—which includes the machine, probe, computer hardware and software, and other supplies—costs between $20,000 and $25,000, he says.—By **David Elstein,** ARS.

This research is part of Food Animal Production, an ARS National Program (#101) described on the World Wide Web at www.nps.ars.usda.gov.

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